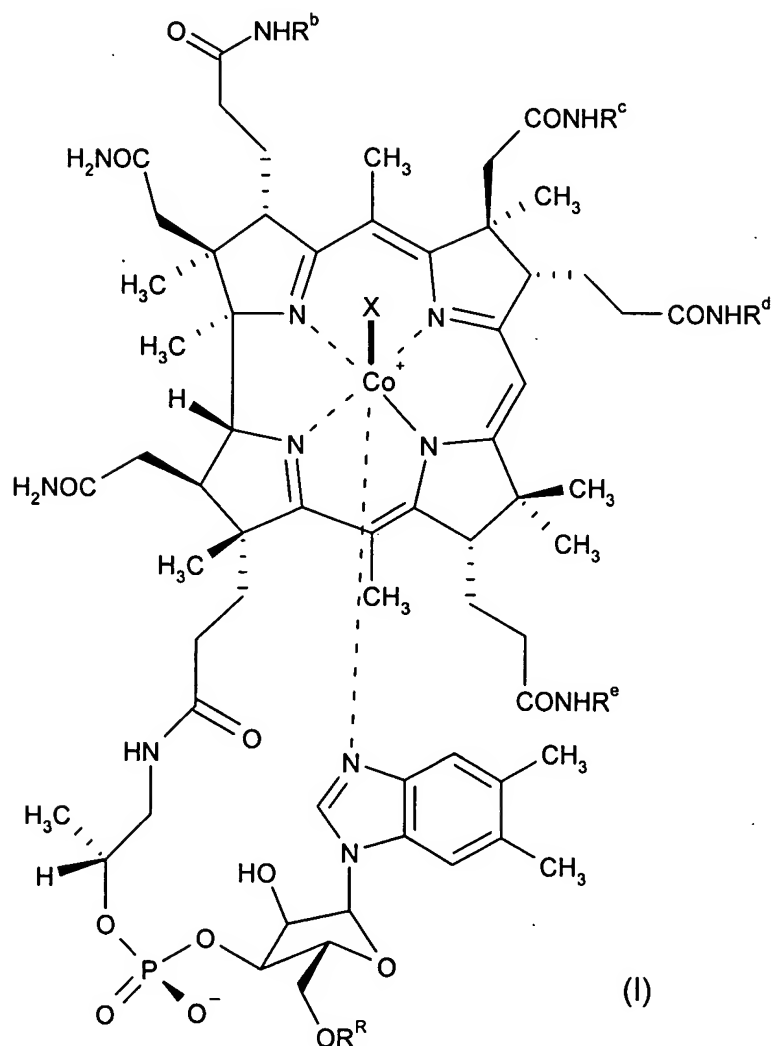


# AMENDMENTS TO THE CLAIMS

1. (Currently amended) A cobalamin derivative of formula (I):



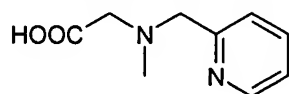
wherein:

- (i) ~~R<sup>b</sup>, R<sup>c</sup>, R<sup>d</sup>, and R<sup>e</sup>, independently of each other, are~~ is a spacer-chelator group optionally carrying a metal atom; ~~an antibiotic or antiproliferative therapeutic agent, a sterically demanding organic group with 4 to 20 carbon atoms, or hydrogen;~~
- (ii) ~~R<sup>c</sup>, R<sup>d</sup>, R<sup>e</sup>, and R<sup>R</sup> is a spacer-chelator group or are~~ an antibiotic or antiproliferative therapeutic agent, each connected through a linker Z, or hydrogen;

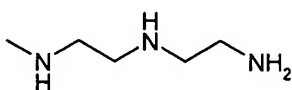
(iii) with the proviso that at least ~~one~~<sup>two</sup> of the residues  $R^b$ ,  $R^c$ ,  $R^d$ ,  $R^e$  and  $R^R$  are hydrogen, ~~at least one of the residues  $R^b$ ,  $R^c$ ,  $R^d$  and  $R^e$  is different from hydrogen, and at least one of the residues  $R^b$ ,  $R^c$ ,  $R^d$  and  $R^R$  is a spacer-chelator group;~~

(iv) X is ~~a monodentate ligand~~ cyano, methyl, hydroxy, aquo or a 5'-deoxyadenosyl group;  
and

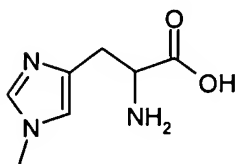
(v) the central cobalt (Co) atom is optionally in the form of a radioactive isotope; and  
wherein the spacer-chelator group ~~comprises~~ consists of an aliphatic chain of 2 to 4 carbon atoms carrying a chelator selected from the chelators of formulae (II) to (IX):



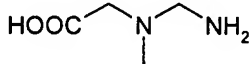
(II)



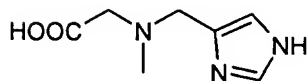
(III)



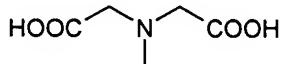
(IV)



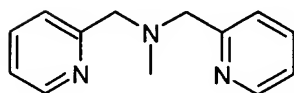
(V)



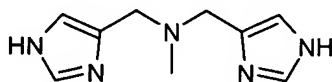
(VI)



(VII)



(VIII)



(IX)

wherein carboxyl groups in formulae (II) to (IX) may be present as esters; and  
said cobalamin derivative:

(a) has no binding affinity or less than 20% binding affinity to transcobalamin II when compared to the binding affinity of non-modified cobalamin in a binding test, and

(b) retains activity as a vitamin B12 substitute.

**2. (Previously Presented)** The cobalamin derivative according to claim 1 retaining more than 2% of the activity as a vitamin B12 substitute in a growth assay.

**3. (Original)** The cobalamin derivative according to claim 1  
(a) having less than 10% of binding affinity to transcobalamin II when compared to the binding affinity of non-modified cobalamin in a binding test, and  
(b) retaining more than 10% of the activity as a vitamin B12 substitute in a growth assay.

**4. (Original)** The cobalamin derivative according to claim 1  
(a) having less than 5% of binding affinity to transcobalamin II when compared to the binding affinity of non-modified cobalamin in a binding test, and  
(b) retaining more than 10% of the activity as a vitamin B12 substitute in a growth assay.

**5. (Previously presented)** The cobalamin derivative according to claim 1 carrying a therapeutic and/or diagnostic agent.

**6. (Previously presented)** The cobalamin derivative according to claim 1 carrying a radioactive metal.

**7-10. (Cancelled)**

**11. (Previously presented)** The cobalamin derivative according to claim 6 wherein the radioactive metal is  $^{94m}\text{Tc}$ ,  $^{99m}\text{Tc}$ ,  $^{188}\text{Re}$ ,  $^{186}\text{Re}$ ,  $^{111}\text{In}$ ,  $^{90}\text{Y}$ ,  $^{64}\text{Cu}$ ,  $^{67}\text{Cu}$  or  $^{177}\text{Lu}$ .

**12. (Cancelled)**

**13. (Currently Amended)** The cobalamin derivative according to claim 12\_1 wherein X is cyano.

**14. (Currently amended)** The cobalamin derivative according to claim 1, wherein the central cobalt atom is the radioisotope  $^{57}\text{Co}$  or  $^{60}\text{Co}$ .

**15. (Currently amended)** The cobalamin derivative according to claim ~~14~~10, wherein  $\text{R}^b$  is a spacer-chelator group optionally carrying a metal atom, the spacer is an aliphatic chain of 2 to 4 carbon atoms, and the chelator is of formula (II), wherein the group  $\text{COOH}$  is optionally in the form of an ester;

$\text{R}^c$ ,  $\text{R}^d$ ,  $\text{R}^e$  and  $\text{R}^R$  are hydrogen; and

X is cyano.

**16. (Previously Presented)** The cobalamin derivative according to claim 15, wherein  $\text{R}^b$  is a spacer-chelator group optionally carrying a metal atom, the spacer is an aliphatic chain of 4 carbon atoms, and the chelator is of formula (II), wherein the group  $\text{COOH}$  is in the form of the ethyl ester;

$\text{R}^c$ ,  $\text{R}^d$ ,  $\text{R}^e$  and  $\text{R}^R$  are hydrogen; and

X is cyano.

**17. (Currently amended)** The cobalamin derivative according to claim ~~10~~1, wherein  $\text{R}^d$  is a spacer-chelator group optionally carrying a metal atom, the spacer is an aliphatic chain of 3 carbon atoms, and the chelator is of formula (II), wherein the group  $\text{COOH}$  is optionally in the form of an ester;

$\text{R}^b$ ,  $\text{R}^c$ ,  $\text{R}^e$  and  $\text{R}^R$  are hydrogen; and

X is cyano.

**18. (Currently amended)** The cobalamin derivative according to claim ~~10~~1, wherein  $\text{R}^b$  is a spacer-chelator group optionally carrying a metal atom, the spacer is an aliphatic chain of 2 carbon atoms, and the chelator is of formula (III);

$\text{R}^c$ ,  $\text{R}^d$ ,  $\text{R}^e$  and  $\text{R}^R$  are hydrogen; and

X is cyano.

**19. (Previously presented)** A pharmaceutical composition comprising a cobalamin derivative according to claim 1.

**20. (Currently Amended)** A method of diagnosis of a neoplastic disease ~~or an infection by microorganisms~~ in a mammal comprising

(a) exposing the mammal suspected of being inflicted by a neoplastic disease or an infection to a period of a vitamin B12 – free diet, and

(b) subsequently applying a cobalamin derivative according to claim 1 carrying a diagnostic agent.

**21. (Currently Amended)** A method of treatment of a mammal suffering from a neoplastic disease ~~or an infection by microorganisms~~ comprising

(a) exposing the mammal in need of treatment to a period of a vitamin B12 – free diet, and

(b) subsequently applying a cobalamin derivative according to claim 1 carrying a therapeutic agent.

**22-25. (Cancelled)**

**26. (Previously presented)** The method of claim 20, wherein the cobalamin is effective in cancer imaging.

**27. (Cancelled)**